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Full title of the project	**Assessment of Health management information systems performance and associated factors, Gondar university hospital, North West Ethiopia.**
Duration of project	**January to June,2012**
Study area	**North Gondar zone, Gondar town administration, Gondar university hospital, Amhara regional state, Ethiopia.**
Total cost of the project	**13508birr**

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Acronyms

- **HMIS** - health management information system
- **RHIS**- routine health information system.
- **DHIS**- district health information system.
- **PRISM**- performance routine information system management.
- **HSDP-** health sector development plan.
- **M & E-** monitoring and evaluation.
- **HFs**- health facilities.
- **MOH**- ministry of health.
- **VCT**- voluntary counseling and testing.
- **PMTCT**-prevention of mother to child transmission
- **OBAT**-organizational and behavioral assessment tool.
- **MAT**-management assessment tool.
- **HIV**-Human immunodeficiency virus.
- **AIDS**-acquired immunodeficiency syndrome.

Summary

Introduction:- The assessment of HMIS performance and associated factors are an important mechanism to identify gaps in the management of the health system—and to resolve them to maintain and improve performance. With timely, complete and accurate information, managers can identify strengths and weaknesses of health system functions and services, and take appropriate action to maximize success. For issues outside of their control, they can advocate for possible solutions and policy changes. Many studies have been conducted to evaluate and improve HMIS performance in developing countries but in Ethiopia very few studies have been conducted on HMIS to identify strengths and weaknesses for improvement or any other purpose.

Objective:-To assess HMIS performance and associated factors in Gondar university hospital, north Gondar zone, Gondar town, north west Ethiopia, 2012.

Methods: - An institution based cross-sectional study design will be used to assess HMIS performance and associated factors. Various data collection methods (Self-administered questionnaires, observations, reviews of documents, office records, and HMIS feedback reports) will be used to collect data as per the adapted PRISM tools. Reports, outpatient and inpatient registers, hospital management staff at different levels, health and medical personnel and HMIS officers will be used as a source of data for this study. The total sample size will be 277.Data quality will be assured by checking all data for the completeness before entry. The data will be entered and analyzed using the PRISM data entry and analysis tool/excel sheet. The descriptive statistic and multiple logistic regressions will be carried out to find out relevant association between health management information system performance and associated factors.

Work plan and budget: - The project starts in January 2012 end in June 2012. The total budget required for the project is 13508 birr.

1. INTRODUCTION

1.1. STATEMENT OF THE PROBLEM

The underlying research problem that necessitated this research is the existence of performance related problems with regard to implementation of the new HMIS to improve quality of data and use of information for informed health care decision making. Lack of comprehensive and quality data in Gondar university hospital makes informed health decision making, teaching and learning and research activities difficult and compromised. Despite the fact that Gondar university hospital started implementation of standardized, integrated and simple HMIS as part of national HSDP III since two years due to lack of proper implementation and other issues the different functions of the hospital are still continues to suffer from poor data quality and use of information. This might be due to the fact that HMIS is among the hospital functions that are poorly understood and neglected by the hospital management.

1.2. LITRATURE REVIEW

1.2.1. HMIS performance studies.

A study done on implementation of the newly introduced HMIS and M and E in pioneering regions of Ethiopia reveals that availability of resources for implementation of the new system in majority of health facilities were inadequate, but despite the fact that the low level of availability of resources , the majority of health facilities are implementing the new HMIS effectively. Sixteen (80%) of the health facilities had established performance review teams and 50% of health facilities had conducted performance reviews as per the guideline. Timeliness and completeness of reports showed progressive improvements compared to pre-HMIS implementation periods. Problems were noticed with regard to submitting parallel reports due to demands from programs and donors, creating a huge work burden and compromising the motivation and commitment of the staff towards the new system. Supervision and regular review meetings were conducted less frequently,

but self-monitoring of the progress in health services coverage was performed by HFs, as well as tracking the availability of key health commodities, including tracer drugs. HFs were also taking actions in line with the HMIS and M&E guidelines, resulting in gradual, yet steady, improvements in service coverage and drops in drug stock outs over time. It is concluded that the HFs are doing a lot with less, and recommendations are given in line with findings.(1)

After putting the new integrated, decentralized and action oriented HMIS in to practice Malawi has brought improvements in quality and coverage of services. the midterm review of the achievement of health information system of Malawi judged to be one of the best in Africa, yet very little improvement has been noted in use of information in rationalizing decisions despite the fact that they have replaced vertical program specific information system by a comprehensive, integrated, decentralized and action oriented simple system. The conclusion in this study is that good design of an information system alone will not be effective unless it is supported by internal desire, dedication and commitment of leadership to have an effective and efficient health management information system.(2)

A situational analysis study was conducted on Uganda's HMIS to identify gaps using PRISM framework to explore technical, behavioral and organizational determinants and to document gaps in HIV/AIDS information realizing the need to strengthen HMIS for district decentralization as well as to improve HIV/AIDS service information. According to this study the overall RHIS performance found to very poor. The limited availability of human and in-kind resources negatively affected HMIS performance.

Regarding HIV/AIDS services, information was limited to reporting on suspected cases. There was no information collected on HIV/AIDS services such as VCT, PMTCT, etc. Confidentiality training and confidentiality of VCT data were limited. The findings of this study were used to strengthen HMIS performance.(3)

A literature on PRISM stated that health system needs internal mechanisms to develop performance targets, track progress, and create and manage knowledge for continuous improvement. The Performance of Routine Information System

Management (PRISM) framework, an innovative approach to design, strengthens and evaluates RHIS. The PRISM framework offers a paradigm shift by putting emphasis on RHIS performance and incorporating the organizational, technical and behavioral determinants of performance. By describing causal pathways of these determinants, the PRISM framework encourages and guides the development of interventions for strengthening or reforming RHIS.

Furthermore, it conceptualizes and proposes a methodology for measuring the impact of RHIS on health system performance. Ultimately, the PRISM framework, in spite of its challenges and competing paradigms, proposes a new agenda for building and sustaining information systems, for the promotion of an information culture, and for encouraging accountability in health systems.(4)

Pre-post intervention study , time-motion studies, medical record audits and physician surveys were conducted in Ethiopia to evaluate the impact of an inexpensive business process re-engineering project on the accessibility and completeness of patient information and on physician satisfaction this studies showed that Medical record accessibility and completeness and physician satisfaction improved significantly ($P < 0.05$) based on pre- and post-intervention comparisons. The success rate of retrieving the proper medical record number for returning patients improved from 14 to 87% ($P < 0.01$); time to locate medical records decreased from 31.2 sec per record to 15.7 sec per record ($P < 0.01$); the percentage of complete medical records increased from 6.5 to 45.7% ($P < 0.01$). Physician satisfaction with the medical records system was significantly higher after the intervention ($P = 0.02$).therefore what we can learn from this study is that a well-organized medical record management system can be effective in improving patient information accessibility and completeness in hospitals in low-income countries despite the lack of resources. This study recommends that longer follow-up is required to assess the sustainability of the hospital improvements accomplished.(5)

HMIS performance assessment was conducted in Guanajuato state of Mexico in 2010 by using PRISM tools. The findings showed that the overall performance of HMIS in the state found to be at a good performance levels with regard to data

accuracy, completeness, timeliness, use of information, HMIS processes, technical, behavioral and organizational determinants. Even if the overall performance of HMIS is found to be good in most of the aspects the paper has recommends that there is a room for continuously improving the information system for optimal performance and put also short term recommendations as follows: improve HMIS skills in data interpretation, use of information for problem solving and increase the use of performance improvement tools, improve feedback /supervision systems which focus on checking data quality and use of information.(6)

Seeking a deeper understanding of the effects of organizational and behavioral factors on data quality and use of information MOH in Mexico has used OBAT to assess its HMIS in relation to these two factors. The survey revealed gaps between respondents' perception of the promotion of a culture of information and their actual competence and knowledge of HMIS tasks. This indicates opportunities to bridge gaps. Findings were used to strengthen HMIS performance in Mexico. (7)

All prism tools were used to identify HMIS performance level and its determinants in South Africa. Comparisons were made among organizational and behavioral factors and HMIS performance to find an insight on how the different components of HMIS system are poorly coordinated and to identify underperformance and its determinants to create opportunities for optimizing HMIS performance. RHIS performance was assessed in two dimensions. The data accuracy and the information use level which was found to be only 43% and 65% respectively.

This study found that respondents strongly believed the department promotes checking data quality, problem solving and use of information, coupled with a perceived high level of confidence in carrying out HMIS tasks.

In contrast, very few of the respondents showed HMIS task competence for checking data quality, problem solving and use of information .This indicated that major gaps between HMIS performance and its determinants exist. In addition,

both staff and management have a limited understanding of the determinants of poor performance. The PRISM framework highlighted systemic gaps in HMIS function and showed that the responsibility for improved performance rests with senior management and staff at all levels. The need for better coordination and harmony within the different components of RHIS was recognized, as well as the need for better self-assessment tools, better problem-solving skills and continuous improvement. (7)

The Government of Pakistan wanted to change the pre-existing centralized HMIS system to a district-based one to improve accountability and performance and to expand HMIS to secondary hospitals and the private sector.

As part of the study to reform Pakistan's HMIS, PRISM tools were used to identify strengths and weaknesses in the existing HMIS. The reform process included a baseline assessment, design and pilot testing of the new DHIS and an evaluation of the pilot test to assess feasibility for scale-up. A reform package was developed and pilot-tested based on the findings of the assessment study and consensus-building with stakeholders at all levels. The new DHIS extended the HMIS to secondary hospitals and decreased the number of data items in the monthly report from 446 to 131.

The pilot DHIS was evaluated after six months, based on the criteria of user-friendliness, satisfaction, time consumption, expansion to secondary hospitals and improvement in data quality and information use.

The baseline assessment showed that HMIS data accuracy (41%) and information use (10%) were limited. some of the contributing factors were low HMIS task competence and lack of mechanism for checking data accuracy.

Evaluation of the districts in the pilot test showed that the new DHIS implementation was well-received.

90% of respondents were satisfied with the DHIS design, its tools and the training they received; HMIS performance improved. The level of data accuracy before intervention was 40%, which improved to 75% after intervention. Similarly, use of information levels improved from 10% before intervention to 55% after intervention.

This found to be due to the availability of meeting registers, which facilitated recording of the discussions and decisions during the monthly meeting of the facility staff and district officials; 30% of facilities surveyed applied the new data accuracy checklist for self-assessing their data quality at the facility level. This was a big achievement for initiating a new behavior. The HMIS reform activity was intended to improve HMIS performance, improving accuracy and use of information for decision-making at the district level and below. (8)

An article entitled HMIS a tool to gauge patient satisfaction and quality of care stated that the health management information system (HMIS) is an instrument which could be used to improve patient satisfaction with health services by tracking certain dimensions of service quality. Quality can be checked by comparing perceptions of services delivered with the expected standards. The objective of the HMIS would be to record information on health events and check the quality of services at different levels of health care. The importance of patient assessment is a part of the concept of giving importance to patient's views in improving the quality of health services. Expected benefits include enhancing patient satisfaction through improved communication; greater provider sensitivity towards patients; enhanced community awareness about the quality of services; and overall better use of services in the health system.(9)

A study on the effects that the introduction and adoption of a health management information system (HMIS) will have on both the productivity of health center staff as well as on user-satisfaction was conducted in Yonsei University College of Medicine, Seoul, Korea. This study found that HMIS increased the productivity and satisfaction of the staff but did not increase their persuasion and decision levels; and, that is also succeeded in increasing the levels of visitors' satisfaction with the services provided.(10)

Qualitative study was conducted in Pakistan to explore the perceptions of health managers to identify the status and issues in use of HMIS. Managers who were

participated in the study identified a number of reasons resulting in non-use, misuse and disuse of data. These included limited scope of HMIS, dubious data quality, political motives behind demand of data and an element of corruption in data reporting etc. according to this paper a great deal of political and administrative will is required to institutionalize transparency in decision making in health management and HMIS is an important tool for doing so. Appropriate legislation and regulations are needed to create a conducive policy environment that would help in changing the existing decision making culture. The effective use of information requires that besides capacity development of district health managers in understanding and use of data, the higher level decision makers are provided with relevant data timely and in an easily understandable form along with the recommended actions pertinent to this data.(11)

A study conducted in Nigeria on HIV counseling and testing management information system used an iterative brainstorming technique among 30 participants (volunteer counselors and project management staff) as well as iterative quality audits to identify limitations of success and propose solutions. The proposed solutions were implemented and reevaluated for performance. Findings from the evaluations were then reintroduced into the brainstorming and planning sessions. Several limitations were identified with the most prominent being the poor documentation of records at the site and the lack of a document transfer trail for audit purposes.

The study concluded that Communication, cohesion and team focus are necessary to achieve success on any new project. Institutionalizing routine HIV behavioral surveillance using data collected at HCT will help in streamlining interventions that will be evidence-based.(12)

Bottom-up audit was conducted in to assess routine primary care health information system data quality in Sofala, Mozambique. This study investigates primary health care HIS data availability and reliability. The quality of HIS data was validated by comparing three key indicators (antenatal care, institutional birth, and third

diphtheria, pertussis, and tetanus [DPT] immunization) with population-level surveys over time. This study found that the data concordance from facility clinical registries to monthly facility reports on five key indicators–the number of first antenatal care visits, institutional births, third DPT immunization, HIV testing, and outpatient consults–was good (80%). When two sites were excluded from the analysis, the concordance was markedly better (92%). Of monthly facility reports for immunization and maternity services, 98% were available in paper form at district health departments and 98% of immunization and maternity services monthly facility reports matched the Ministry of Health electronic database. Population-level health survey and HIS data were strongly correlated (R = 0.73), for institutional birth, first antenatal care visit, and third DPT immunization. Given the findings HIS data fund to be both reliable and consistent, supporting their use in primary health care program monitoring and evaluation. Lastly this paper suggests that Simple, rapid tools can be used to evaluate routine data and facilitate the rapid identification of problem areas. (13)

Qualitative comparative case-study was conducted in two districts of Zambia focused on investigating the presence and behavior of five formally identified, different information forms, including that from HMIS, in the strategic decision-making process. The aim of the study was to determine the validity of current arguments for HMIS, and establish implications for current HMIS policies.

The study confirmed the existence of different forms of information in the organizational environment, including that provided by the conventional HMIS. These information forms attach themselves to various organizational management processes and key aspects of organizational routine. The study results point to the need for a radical re-think of district health management information solutions in ways that account for the existence of other information forms outside the formal HMIS in the district health system. (14)

A study which was conducted in Mali on the potential of software packages for developing countries has witnessed the potential of open source in the field of health IT for developing countries like Mali. A new soft ware system was introduced in Mali health center to serve patient administrative and medical records management of hospital activities, tracking of practitioners' activities, infrastructure management and the billing system. After several months of use, the usability aspects of the system were evaluated including feedback from end-users. The study showed that the system was broadly accepted by all the users who participated in the study. 77% of the participants found the system useful; 85% found it easy; 100% of them believe the system increases the reliability of data. The same proportion encouraged the continuation of the experiment and its expansion throughout the hospital. (15)

A paper which investigates the health management information system (HMIS) implementation process in Uganda, advocates utilizing the diffusion of innovation and dynamic equilibrium organizational change models. According to this paper neither perspective guided the HMIS development process. Instead, technological issues, rather than wider organizational issues, dominated the planned change. The paper emphasizes the need to consider the organizational context when changing information systems. This was not realized before when attempting to understand the causes of information management problems and developing HMIS in low-income countries. This study stated that organizational theory can contribute to the diffusion of innovation framework. This paper concluded that diffusion of innovation framework and organizational forces should bring to equilibrium when an attempt is made to understand the causes of information management problems and developing HMIS in low-income countries. (16)

A literature survey done on health promotion and information systems reveals that poor infrastructure, inappropriate donor policies and strategies, poor infrastructure and inadequate human resource capacity to be the main factors accounting for the sustainability problem on development of computer based health information systems in less developed countries. The paper proposed that the activities involved in the implementation of these systems be incorporated into organizational routines.

This will ensure and secure the needed resources as well as the relevant support from all stakeholders of the system; on a continuous basis.(17)

Assessment of hospital management systems in Ethiopia demonstrated weak functioning in several management areas. This was stated to be due to the fact that vast majority of health system capacity-building efforts have focused on enhancing medical and public health skills; less attention has been directed at developing hospital managers despite their central role in improving the functioning and quality of health-care systems. In response, a novel Master of Hospital Administration (MHA) program has started in the country. The program was a 2-year executive style educational program to develop a new cadre of hospital leaders, comprising 5% classroom learning and 85% executive practice. The paper finally concluded that designing a program containing technical skills with more abstract thinking and problem solving, management education and policy reform, resource constraints in low-income settings, particularly information technology limitations, transfer of knowledge to hospital managers is very important in improving the functioning and quality of health-care systems in developing countries like Ethiopia.(18)

A paper in India states that morbidity and mortality data constitute an important component of a health information system and their coding enables uniform data collation and analysis as well as meaningful comparisons between regions or countries. Increased advocacy for and awareness of a uniform coding system together with adequate capacity building of physicians, coders and other allied health and information technology personnel found to be basic for a valid and reliable health information management system in India. Besides, support from national/institutional health administrators, widespread availability of the ICD-10 material for morbidity and mortality coding, enhanced human and financial resources and optimal use of informatics were advocated as the core requirements for the implementation of disease coding system.(19)

In 2007 and 2008, Myanmar developed a health system strengthening (HSS) strategy and proposal through funding support from the Global Alliance for Vaccines and Immunization (GAVI). In an effort to identify critical success factors in the

development of the HSS strategy in Myanmar international and national literature, and participant observation by the authors in the health systems analysis and HSS strategy development in Myanmar were used as a source of information. The findings of this study shows that evidence-based development of the strategy through a sector analysis, and a long-term approach to strategy development with wide stakeholder participation are the Critical success factors in the development of the HSS strategy which in turn contributed to important strategy breakthroughs in the areas of health planning, health financing, human resource management and civil society partnerships. The paper finally concluded that these innovations in Myanmar provides promising evidence of the potential of the HSS approach as an emerging health development paradigm, particularly in relation to responding to the issue of "within country" inequities in access to health care.(20)

Process evaluation study was carried out in Mozambique between January and March 2003. The study was based on semi-structured interviews, participant observation and review of the data collection materials. The study shows that differences were found for all vaccine types when comparing facility reports with the tally sheets. The same applies when comparing facility reports with district reports. The study also showed that a routine practice during supervision visits was data quality assessment for the outpatient services but none related to data consistency between the tally sheets and the facility report. Expanded Program on Immunization, supervisors concentrated more on the consistency checks between data in the facility reports and the number of vaccines received during the same period. Meetings were based on criticism, for example, why health workers did not reach the target. Nothing in terms of data quality was addressed nor validation rules. According to the recommendations given in this study the quality of data, and consequently of the information system, must be seen in a broader perspective not focusing only on technicalities (data collection tools and the reporting system) but also on support mechanisms. The study concluded that Implications of a poor data quality system will be reflected in the efficiency of health services facing increased demands, with stagnant or decreasing resources.(21)

After citing the source of information, Rwanda's HMIS assessment report advocates the importance of using internationally recognized HMIS best practices for assessing existing systems. Those are: content that is timely and relevant for users at all levels, access that fosters ownership and ongoing use and learning, communication and promotion of data use in evidence-based decisions. The literature emphasizes that endorsing and applying these three principles creates a virtuous cycle that reinforces effective stakeholder engagement, supports data quality assurance, and facilitates sustainable institutionalization of effective information management systems that support informed decision-making at all levels.(22)

A literature on Health metrics network states that Health information system performance should be measured not only on the quality of data produced, but on evidence of the continued use of data to improve health system performance, to respond to emergent threats, and to improve health. Improving health information systems in terms of data availability, quality and use often requires interventions that address a wide range of possible "determinants of performance". Broader analysis of all these categories of determinants of health information system performance can identify the opportunities and constraints in effective and strategic data collection and production and in the use of information for decision-making. Strategies to improve performance can then be developed.

Discussing the challenges the literature says, Motivating data collectors remains a challenge despite training on data-collection registers and questionnaires. Negative attitudes among clinicians and health workers – such as data collection is a useless activity or a waste of care-provider time – are detrimental to data quality. The knowledge and skills required for data processing, analysis, interpretation and problem-solving are usually not given due attention, which affects the ability to use information. Data collectors and users work in specific environments and organizational cultures, and are influenced by them. The perceptions and attitudes of senior management towards health information system design and implementation will have a determining influence on system performance. For example, the value of collecting information may be questioned if senior health managers do not allocate

resources based on evidence and information. If senior managers fail to promote evidence-based decision-making and the use of information for transparency and accountability then a culture of information is unlikely to be fostered. The literature recommends the importance of examining the perceptions, attitudes and values of senior managers and other organization members in relation to information related functions.(23)

1.3. JUSTIFICATION OF THE STUDY

The HMIS assessment is an important mechanism to identify gaps in the management of the health system—and to resolve them to maintain and improve performance. With timely, complete and accurate information, managers can identify strengths and weaknesses of health system functions and services, and take appropriate action to maximize success. For issues outside of their control, they can advocate for possible solutions and policy changes.

Data quality and a culture of use of information, which are components of HMIS, are very fundamental for carrying out quality health care delivery, teaching and learning and research activities, which are regarded as the main functions in tertiary hospitals.

Currently university hospitals are required to be center of excellence and role models where best practices with regard to teaching and learning, research and community service provision are taken, which will be impossible without strong information systems in place. Besides, the need for attitudinal change towards the importance of strong and properly implemented HMIS among hospital management staff has to be brought through evidence based HMIS performance assessment findings.

The performance of HMIS has to be assessed and corrective actions have to be taken regularly in all health facilities in general and in tertiary university hospitals, like Gondar university hospital in particular, which is serving as a center for teaching and learning, research and community service in the region.

In general the performance of HMIS and its impacts on the different functions of the university hospital are not studied so far, as far as my literature review is concerned.

This study will therefore help to assess the overall performance of HMIS and identify the different factors affecting it in the hospital and ultimately help to improve quality of data and continued use of health information for evidence-based decision making.

Finally, in this study the overall performance of HMIS will be evaluated based on data quality and information use using performance diagnosis tool of PRISM frame work in the hospital followed by studying organizational , behavioral and technical factors that affect HMIS performance using PRISM tools designed to do so. The findings will be communicated for possible interventions to alleviate the problem because PRISM tools Support RHIS improvements by objectively measuring performance and identifying the factors that hinder performance.

2. OBJECTIVE

2.1. GENERAL OBJECTIVE

- ✓ To assess the performance of the new HMIS and associated factors, at Gondar university hospital, North West Ethiopia 2012.

2.2. SPECIFIC OBJECTIVES

- ➢ To determine the performance of a health management information system.
- ➢ To identify associated factors which determine HMIS performance.

3. METHODS

3.1. Study design

Institution based cross-sectional study design will be deployed to assess the performance of the new HMIS and factors affecting it in Gondar university hospital, north Gondar zone , Gondar town administration, north west Ethiopia 2012.

3.2 Study area and Study period

The study will be conducted in north Gondar zone, Gondar town administration. Gondar university hospital, North West Ethiopia. Study will be conducted starting from January to June/2012 G.C

3.3. Source of population

All HMIS data collection tools, health care providers, management staff at all levels, found in the university hospital.

3.4. Study population

All out patient registers tally sheets and reports, health units/departments, hospital management staff at all levels, all health and medical staff of any category working in the hospital.

3.5. **Inclusion criteria**

People involved in HMIS implementation and voluntary to be involved in the study.

3.6. Study Variables

- **Dependent variable:** HMIS performance(data quality and use of information)
- **Independent variables:**

  -sociodemographic characteristics-age, sex, type of profession, years of experience.

  -Availability of resources- Computer, Data Back-up Unit Printers, Modems, UPS, Generators, Regular telephone, Radio telephone Access to the internet

  -Behavioral determinants—the knowledge, skills, attitudes, values, and motivation of the people who collect and use data.

  -Technical determinants—Data collection processes, systems, forms, and methods.

  -Organizational/environmental determinants—Information culture, structure, resources, roles, and responsibilities of the health system and key contributors at each level.

3.7. Operational definition of variables

- **HMIS PERFORMANCE** - data quality and the degree to which information is used for evidence-based decision making.
- **AVAILABILITY OF RESOURCES-** the presence of HMIS packages or materials which are useful for carrying out HMIS related tasks, such as hard wares, utility lines, registers, forms etc.
- **ORGANIZATIONAL AND BEHAVIORAL FACTORS-** the necessary knowledge, skills, problem-solving ability, confidence and motivation? a culture that values information quality and use? Comparing these factors with RHIS performance identifies gaps and opportunities for improvements.
- **MANAGEMENT AND SUPPORTIVE PRACTICES-**trainings, supervisions, reports, feedback etc

3.8. SAMPLE SIZE CALCULATION

The sample size is determined using the following: A 95 % confidence interval 50 % single population proportion a marginal of error 5 % and 10 % non response rate are added to the total sample.

Sample size is computed based on single proportion formula assuming HMIS performance to be 50% because there is no research that has been conducted on this topic in a similar health facility in Ethiopia. A z-value of 1.96 will be used at 95% CI and d of 5%. (n= sample size, p= probability, d= margin of error).

n = z2 p (1-p), n= (1.96)2x (0.5) (0.5) =384.16 d2 (0.05)2 .So with adjustment for non-response (10% contingency) the subjects will be chosen by using probability proportional to sample size.

The maximum calculated sample size is 384.The final sample size will be **422** including 10% non-response rate.

3.9. Sampling procedures

The sampling procedure will depend on the PRISM tools to be used.

- The overall performance of HMIS in Gondar university hospital data will be gathered using HMIS performance diagnostic tool of PRISM framework.
- Data with regard to availability of the necessary resources to accomplish HMIS tasks in the hospital will be gathered using facility/office checklist.
- HMIS management data will be collected through observation of different departments/units using HMIS management assessment tool of PRISM framework, while organizational and behavioral data will be gathered through structured self administered questionnaire using organizational and behavioral assessment tool of PRISM frame work from all health and medical personnel working in the hospital during the period of this study.
- Besides, to collect data using organizational and behavioral assessment tool health care workers and significant others found in Gondar university hospital will be included in the study. Based on the number of health care workers working in each professional category number of study subjects will be assigned proportionally.

- Health care workers in the hospital will be stratified and samples will be allocated proportionally based on their professional status and then simple random sampling will be done within each category in terms of the composition of health care workers (doctors, Health officers, Nurses, physiotherapists, laboratory technicians, dentistry, health assistance, aestheticians, pharmacists and other junior health workers) to select the final study subject. Finally total of 277 i.e. 257 health care workers and 20 heads of different health units will make up the whole sample.

Table 1. **Review of tools, data collection methods and data sources to be used during the study.**

Tool/data collection method to be used	**Source of data/information**	**Sample size**	**Remark**
HMIS performance assessment tool/ structured interview	Heads of health units/departments	20	
HMIS resource office check list/structured interview	Heads of health units/departments	----	Similar data sources as above will be used.
MAT/observation	Health units/departments	All Health units	
OBAT/self administered questionnaire	Health and management staff at all levels.	422	
		Total=422	

3.10. DATA COLLECTION PROCEDURE

3.10.1. **DATA COLLECTION INSTRUMENTS**

Four PRISM tools will be used in this study:

RHIS Performance Diagnostic Tool. The primary component in the toolset, this determines the overall level of RHIS performance, looking separately at quality of data and use of information, to identify weak areas. This diagnostic tool identifies strengths and weaknesses; the other three tools identify the underlying technical, organizational, and behavioral reasons for those strengths and weaknesses. Uses observations and interviews, supplemented by document research.

RHIS Overview and Facility/Office Checklist. This examines technical determinants such as the structure and design of existing information systems in the health sector, information flows, and interaction between different information systems. This tool is used to understand the availability and status of RHIS resources and procedures used at health offices and facilities. Uses observations and interviews, supplemented by document research.

Organizational and Behavioral Questionnaire. This looks at behavioral and organizational factors that affect RHIS performance. Do staffs have the necessary knowledge, skills, problem-solving ability, confidence and motivation? Does the organization promote a culture that values information quality and use? Comparing these factors with RHIS performance identifies gaps and opportunities for improvements. Collects data via self-administered questionnaires.

RHIS Management Assessment Tool. This is designed to rapidly take stock of the management and supportive practices of RHIS, and to aid in developing recommendations for RHIS management.

3.10.2. DATA QUALITY CONTROL ISSUES

. The collected data will be checked out for the completeness, accuracy and clarity by the Principal Investigator and Supervisors. This quality checking will be done daily after data collection and amendments will made before the next data collection measure. Data clean up and cross-checking will be done before analysis. Training will be given to data supervisor for three days on how to get the questionnaire properly filled and on how to assist participants when filling the questionnaires. Supportive supervision will be made by principal investigator and supervisors.

3.11. DATA MANAGEMENT AND ANALYSIS

After coding the data will be entered and analyzed, using PRISM data entry and analysis tool/ excel sheet. Analysis will be done by the principal investigator using the same computer package. The descriptive statistic and multiple logistic regressions will be further carried out to explore relevant association between health management information system performance and associated factors using SPSS.

4. ETHICAL CONSIDERATIONS

This study will be carried out after getting permission from the ethical review committee of University of Gondar. Official letters will be submitted to Gondar university hospital. Informed verbal consent will be obtained from the study subjects, following an explanation about the purpose of the study and on what will expected from them. Issues related to confidentiality and any potential risk and benefits from participation in the study will be discussed. In addition participants will be informed that participation is voluntary and that they can withdraw at any time without any precondition. Upon getting the necessary data from participants of the study acknowledgement will be forwarded.

5. Dissemination and utilization of results

The results of the study will be presented to the school of public health, to the university hospital and to significant others who are in need of these results and will request the management of the hospital to act accordingly using the result/findings of the study.

WORK PLAN

Table showing a work plan: - Assessment of HMIS performance and factors affecting it using PRISM framework, Gondar university hospital, North West Ethiopia, 2012.

sr.no	Activity	Responsible person	Jan.				Feb.				March				April				May				June			
			week				week				week				week				week				week			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Development of the research Proposal	Investigator																								
2	Securing ethical clearance	Investigator																								
3	Securing budget	Funding agency																								
4	Recruitment and training of data collectors and supervisors	Investigator																								
5	Duplication of data collection questionnaire	Investigator																								

sr.no	Activity	Responsible person	Jan.				Feb.				March				April				May				June			
			week				week				week				week				week				week			
			1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
6	Data collection	Investigator																								
7	Data coding, entry and Cleaning	Investigator																								
8	Data analysis	Investigator																								
9	Thesis write up & submission of first draft	Investigator																								
10	Second draft submission, defense and final thesis submission	Investigator																								

BUDGET

Budget Breakdown for Undertaking a Post Graduate Research: Assessment of HMIS performance and factors affecting it using PRISM framework, Gondar university hospital, North West Ethiopia.

Budget Category						
Part I: Personnel costs						
S .No	**Title**	**Quantity**	**Unit Costs**	**No of Days**	**Total/ETB/**	**Activity**
1	Data collector and supervisors training	5	70	3	1050	Getting training
2	Data collector	3	70	21days	4410	Data collection
3	Supervisor	2	70	21 days	2940	supervision
	Sub total				8400	

S .No	**Title**	**Unit costs**	**Quantity**	**Total/ETB/**	**Activity**
	Duplicating paper	120	10	1200	
	Pen	3	5	15	
	Pencil	1	5	5	

	Note pad	10	5	50	
	Duplication of Questionnaire			2000	
	Printing			600	
	Sub total			3880	

Budget summary

Category	Cost in ETB	
Personal costs	8400	
Stationary costs	3880	
Contingency (10%)	1228	
Total	**13508**	

ANNEXES:

Annex I: References

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Annex II-questionnaire

RHIS Performance Diagnostic Tool **Quality of Data Assessment: Health Facility Form**					
Date of Assessment:		Name of the Assessor:		Name and Title of person Interviewed:	
District		Facility/department		Type	
Data Recording					
FQ1	Does this department/ facility keep copy of RHIS monthly reports sent to the hospital HMIS/district office?	1.Yes		0.No	If no, go to FQ5
FQ 2	Count the number of RHIS monthly reports that are kept at the department/facility for the last 12 months				

FQ 3	Does this department/facility keep outpatient/inpatient register?		1.Yes	0.No	If no, go to FQ5
Data Accuracy Check					
FQ 4	Find the following information for the two months in the outpatient/inpatient register. If the department/facility does not keep the copy of the monthly report, obtain the copy at the hospital HMIS/district office and complete the exercise. Compare the figures with the reports from the computer.				
	Item	a. Month (specify)	b. Month (specify)		
		# from register	# from report	# from register	# from report
4A					
4B					
4C					
4D					
FQ 5	Did you receive a directive from the Senior Management/district office to:				
	5A Check the data accuracy at least once in three months? 1.Yes, Observed				0. No
	5B Fill the monthly report form completely 1.Yes, Observed				0. No
Data Completeness					
FQ 7	What is the number of data items in the RHIS monthly report that department/ facility need to report? Excludes the number of data items for services not provided by this				

	department/ health facility.		
FQ 8	Count the number of data items that are supposed to be filled by this department/facility but left blank without indicating “0” in the last month report.		
Data Transmission /Data Processing/Analysis			
FQ 9	Does data processing procedures/tally sheet exist?	1. Yes Observed	0. No
FQ 10	Does the department/facility produce the following?		
FQ A	Calculate indicators department/facility catchment area	1. Yes, Observed	0. No
FQ B	Comparisons with district/national targets	1. Yes, Observed	0. No
FQ C	Comparisons among types of services coverage	1. Yes, Observed	0. No
FQ D	Comparisons of data over time (monitoring over time)	1.Yes, Observed	0. No
FQ 11	Does the procedure manual for data collection/definitions exist?	1. Yes, Observed	0. No

RHIS Performance Diagnostic Tool **Use of Information: Facility Assessment Form**				
Date:		Name of assessor		
Department/Facility Name		Name of respondent and title:		
District:		Facility Type:		
RHIS report production				
FU1	Does this department/facility compile RHIS Data?	1.Yes	0.No	
FU2	Does the department/facility compile any report containing RHIS information?	1.Yes	0.No	If no , go to FU4
FU3	If yes, Please list reports that contain data/information generated through RHIS. Please indicate frequency of reports and the number of times the report was actually issued for the last 12 months. Please confirm the issuance of the report by observing it.			
	1. Title of the report	2. No. of times this report is supposed to be issued per year	3. No. of times that report are actually issued for the last 12 months	
FU3a				
FU3b				

FU3c			
FU3d			‘‘
FU4	Did the department/facility receive any feedback report from district office on their performance for the last three months?	1.Yes	0. No

Display of information				
FU5	Does the department/facility display the following data? Please indicate types of data displays and whether the data are updated for the last reporting period.		If no go to FU6	
	1. Indicator	2. Type of display (Please tick)	3. Updated	
FU5a	Related to mother health	Table	1.Yes	0.No
		Graph/Chart	1.Yes	0.No
		Map/other	1.Yes	0.No
FU5b	Related to child health	Table	1.Yes	0.No
		Graph/Chart	1.Yes	0.No
		Map/other	1.Yes	0.No
FU5c	Facility Utilization			
FU5d	Disease surveillance			
FU6	Does the facility have a map of catchment area?		1.Yes	0.No
FU7	Does the office display a summary of demographic information such as population by target groups?		1.Yes	0.No

FU8	Is feedback, quarterly, yearly or any other report on RHIS data available, which provides guidelines/ recommendations for actions?	1.Yes	0.No	If no go to FU10
FU9	If yes, what kinds of decisions are made in reports of RHIS data/information for actions? Please check on types of decision based on types of analyses present in reports.			
Types of decisions based on types of analyses				
FU9a	Review strategy by examining service performance target and actual performance on month to month comparisons	1.Yes	0.No	
FU9b	Review department/facility personnel responsibilities by examining service target and actual performance on month to month comparisons	1.Yes	0.No	
FU9c	Mobilization/shifting of resources based on comparison by services	1.Yes	0.No	
FU9d	Advocacy for more resources by comparing performance by targets and showing gaps	1.Yes	0.No	

	Discussion and Decision on RHIS information			
FU10	Does the department/facility have routine meetings for reviewing managerial or administrative matters?	1.Yes	0.No	If no, go to UI15
FU11	How frequently is the meeting supposed to take place?			
FU12	How many times did the meeting take place during the last three months?			
FU13	Is an official record of management meetings maintained?	1.Yes	0.No	If no, go to UI15
FU14	If yes, please check the meeting records for the **last three months** to see if the following topics were discussed:			
FU14a	Management of RHIS, such as data quality, reporting, or timeliness of reporting	1.Yes, observed	0. No	
FU14b	Discussion on RHIS findings such as patient utilization, disease data, or service coverage, medicine stock out	1.Yes, observed	0. No	
FU14c	Have they made any decisions	1.Yes, observed	0. No	

	based on the above discussions?			
FU14d	Has any follow-up action taken place on the decisions made during the previous meetings?	1.Yes, observed	0. No	
FU14e	Are there any RHIS related issues/problems referred to next level for actions?	1.Yes, observed	0. No	
	Promotion and Use of RHIS information by the hospital/district/higher level			
FU15	Observed facility received annual/monthly planned targets based on RHIS information	1.Yes	0.No	
FU16	Did records of facility of last three months show that district/senior management issued directives on use of information	1.Yes	0.No	
FU17	Did department/facility receive district/national RHIS office newsletter/report in last three months showing success stories of use of information	1.Yes	0.No	
FU18	Did documentation exist to show use information for various types of advocacy exist?	1.Yes	0.No	

FU19	Did the person in charge of the department/facility participate in meetings at district level to discuss RHIS performance for the last three months?	1.Yes	0.No	
FU20:	Please describe examples of how the department/facility uses RHIS information for health system management	0. No examples	1. Yes (details follows)	
	Supervision by the hospital HMIS/district health office			
FU21	How many times did the hospital/district supervisor visit your department/facility during the last three months? (check the answer)	0. 1. 2 3. 4. >3	If zero, go to FU26	
FU22	Did you observe supervisor having a checklist to assess the data quality?	1.Yes	0.No	
FU23	Did supervisor check the data quality?	1.Yes	0.No	
FU24	Did the hospital HMIS/district supervisor discuss performance of health facilities based on RHIS	1.Yes	0.No	

	information when he/she visited your facility?			
FU25	Did the supervisor help you make a decision based on RHIS information?	1.Yes	0.No	
FU26	Did the supervisor send a report/feedback/note on the last two supervisory visits?	1.Yes	0.No	

Facility/Office Checklist **(Interview department/ Facility Manager or person in charge of RHIS at the office)**		
Person Interviewed (name, title, organization) Facility/Office/department Name Facility/Office/department Address Facility Type (Hospital/Clinic/District office/Region office/Ministry RHIS unit, etc.) Ownership (Public/Private/Mixed)		
(Interviewer: Please verify if the following equipment is available in the department /facility)		
1. Equipment		
Hardware Equipment	**Total Quantity**	**How many are in working condition?**
a. Computer		
b. Data Back-up Unit (e.g. floppy, CD, zip)	0. No 1. Yes	
c. Printers		
d. Modems		
e. UPS		
f. Generators		
g. Regular telephone		
h. Radio telephone		
i. Access to the internet	0. No 1. Yes	
2. Utilities		
a. Is there a continuous electricity supply?	1. Yes	0. No
b. How often is the electricity supply	0.	1. Once a month

interrupted?	Never/occasionally 2. Twice a month 3. Weekly 4. Daily	
c. Is the room, where the computer hardware is kept, air-conditioned?	1. Yes	0. No
d. Is running water available in the facility?	1. Yes	0. No
3. Availability of registers, forms **Type of record, report or register** a. b. c. d. e.	**Have you run out of this form in the past 12 months? If so, why?** 0.No 1. Yes 0.No 1. Yes 0.No 1. Yes 0.No 1. Yes 0.No 1. Yes	

B. Organization of the health facility

B.1. Please describe total number of persons under each category below: (Adapt according to the country situation)

B.2. Title/ post	Number		Number
1. Medical officer 2. Comprehensive nurse registered 3. Comprehensive nurse enrolled 4. Nursing Assistance 5. Clinical officer 6. Laboratory Assistant 7. Health Assistant		10. Health educator 11. Health inspector 12. Laboratory technician 13. Public health dental assistant 14. Anesthetic officer	

8. Dispenser 9. Health information assistant		15. Midwife 16. Support staff 17. Other (specify)	

B.3. Who fills in the HMIS monthly reports? Specify the codes from Q B.2.

B.4. List those staff members who received any training in the recording, processing, or reporting of health information during the last three years, the number of trainings received, and the year of the latest training

B.4.a. Title or Post (Coding from QB.2)	B.4.b. How many Trainings courses/sessions did this person received in the past three years?	B.4.c. Year of last training?	B.4.d. Subjects of last training: 1. data collection 2. data analysis 3. Data display/report 4. 1&2 5. 1&3 6. 2&3 7. 1,2 & 3
1.			
2.			
3.			
4.			
5.			

RHIS Management Assessment Tool **(Observation at department and facility levels)**				
MAT1. Name of the facility /department		MAT2. Name of the Assessor		
MAT3. Name of the district		MAT4: date of assessment		
MATG1	Presence of RHIS Mission displayed at prominent position(s)		0 No	1 Yes
MATG2	Presence of management structure for dealing with RHIS related strategic and policy decisions at department and facility levels		0 No	1 Yes
MATG3	Presence of an updated (last year) facility/district health management organizational chart, showing functions related to RHIS/health information		0 No	1 Yes
MATP1	Presence of RHIS situation analysis report less than 3 year old		0 No	1 Yes
MATP3	Presence of RHIS targets at department/facility level		0 No	1 Yes

MATQ2	Presence of a copy of RHIS standards at department/facility		0 No	1 Yes
MATQ3	Presence of performance improvement tools (flow chart, control chart etc.) at the department/facility		0 No	1 Yes
MATT1	Does department/facility have a RHIS training manual		0 No	1 Yes
MATT3	Presence of schedule for planned training		0 No	1. Yes, for one year 2. Yes, 2 years or more
MATS1	Presence of RHIS supervisory checklist		0 No	1 Yes
MATS2	Presence of schedule for RHIS supervisory visit		0 No	1 Yes
MATS3	Presence of supervisory reports		0 No	1 Yes
MATF1	Presence of RHIS related expense register		0 No	1 Yes
MATF3	Presence of RHIS monthly/quarterly financial report		0 No	1 Yes

Organizational and Behavioral Assessment Tool

(To be filled by staff and management at all levels)

Introduction

This survey is part of the_____, to improve Management Information systems in the hospital. The objective of this survey to help develop interventions for improving information system and use of information. Please express your opinion honestly. Your responses will remain confidential and will not be shared with anyone, except for presented table forms. We appreciate your assistance and co-operation in completing this study.

Thank you.

Agree ☐

Disagree ☐

_____

IDI. Name of facility

ID2. District

DD1. Title of the person filling the questionnaire (circle answer)

(Make these categories appropriate to the host country)

Facility HMIS focal person----------

Other facility staff (specify) ----------

DD2. Age of the person ----------

DD3. Sex 1. Male 2.Female

DD4. Education

1. 10 years 2. Intermediate (11-12) 3. Bachelor (13-14) 4. Master

5. Professional diploma/degree (specify) ----------

6. Other (specify) ----------.

DD5. Years of employment ----------

DD6. Did you receive any training in HMIS related activities in last six months? 0.No 1.Yes

We would like to know your opinion about how strongly you agree with certain activities carried out by _____. There are no right or wrong answers, but only expression of your opinion on a scale. The scale is about assessing the intensity of your belief and ranges from strongly disagree (1) to strongly agree (7). You have to determine first whether you agree or disagree with the statement.

Second decide about the intensity of agreement or disagreement. If you disagree with statement then use left side of the scale and determine how much disagreement that is – strongly disagree (1), somewhat disagree (2) or disagree (3) and circle the appropriate answer. If you are not sure of the intensity of belief or think that you neither disagree nor agree then circle 4. If you agree with the statement, then use right side of the scale and determine how much agreement that is – agree (5), somewhat agree (6) or strongly agree (7) and circle the appropriate answer. Please note that you might agree or disagree with all the statements and similarly you might not have the same intensity of agreement or disagreement and thus variations are expected in expressing your agreement or disagreement. We encourage you to express those variations in your beliefs.

This information will remain confidential and would not be shared with anyone, except presented as an aggregated data report. Please be frank and choose your answer honestly.

Strongly disagree	**1**
Somewhat disagree	**2**
Disagree	**3**
Neither disagree nor agree	**4**
Agree	**5**
Somewhat agree	**6**

Strongly agree	**7**

To what extent, do you agree with the following on a scale of 1-7?

In health department, decisions are based on

D1. Personal liking	1 2 3 4 5 6 7
D2. Superiors' directives	1 2 3 4 5 6 7
D3. Evidence/facts	1 2 3 4 5 6 7
D4. Political interference	1 2 3 4 5 6 7
D5. Comparing data with strategic	
health objectives	1 2 3 4 5 6 7
D6. Health needs	1 2 3 4 5 6 7
D7. Considering costs	1 2 3 4 5 6 7

PRISM Tools Version 3.0.

In health department, superiors

S1. Seek feedback from	
concerned persons	1 2 3 4 5 6 7
S2. Emphasize data quality in	
monthly reports	1 2 3 4 5 6 7
S3. Discuss conflicts openly	
to resolve them	1 2 3 4 5 6 7
S4. Seek feedback from	
concerned community	1 2 3 4 5 6 7
S5. Use HMIS data for	
setting targets and monitoring	1 2 3 4 5 6 7
S6. Check data quality at the facility and	
higher level regularly	1 2 3 4 5 6 7
S7. Provide regular feedback to their staff through	
regular report based on evidence	1 2 3 4 5 6 7

S8. Report on data accuracy regularly	1 2 3 4 5 6 7

In health department, staff

P1. Are punctual 1 2 3 4 5 6 7

P2. Document their activities and keep records 1 2 3 4 5 6 7

P3. Feel committed in improving health status of the target population

1 2 3 4 5 6 7

P4. Set appropriate and doable target of their performance 1 2 3 4 5 6 7

P5. Feel guilty for not accomplishing the set target/performance 1 2 3 4 5 6 7

P6. Are rewarded for good work 1 2 3 4 5 6 7

PRISM Tools Version 3.0.

In health department, staff

P7. Use HMIS data for day to day management of the facility and district

1 2 3 4 5 6 7

P8. Display data for monitoring their set target 1 2 3 4 5 6 7

P9. Can gather data to find the root cause(s) of the problem 1 2 3 4 5 6 7

P10. Can develop appropriate criteria for selecting interventions for a given problem

1 2 3 4 5 6 7

P11. Can develop appropriate outcomes for a particular intervention 1 2 3 4 5 6 7

P12. Can evaluate whether the targets or outcomes have been achieved

1 2 3 4 5 6 7

P13. Are empowered to make decisions 1 2 3 4 5 6 7

P14. Able to say no to superiors and colleagues for demands/decisions

not supported by evidence 1 2 3 4 5 6 7

P15. Are made accountable for poor performance 1 2 3 4 5 6 7

P16. Use HMIS data for community education and mobilization 1 2 3 4 5 6 7

P17. Admit mistakes for taking corrective actions 1 2 3 4 5 6 7

Personal

BC1. Collecting information which is not used for decision making discourages me 1 2 3 4 5 6 7

BC2. Collecting information makes me feel bored 1 2 3 4 5 6 7

BC3. Collecting information is meaningful for me 1 2 3 4 5 6 7

BC4. Collecting information gives me the feeling that data is needed for monitoring facility performance 1 2 3 4 5 6 7

BC5. Collecting information give me the Feeling that it is forced on me

1 2 3 4 5 6 7

BC6. Collecting information is appreciated by Co-workers and superiors

1 2 3 4 5 6 7

U1.Describe at least three reasons for collecting data on monthly basis on the followings:

U1A. Diseases

1.

2.

3.

U1B. Immunization

1.

2.

3.

U1C. Why is population data of the target area needed?

1.

2.

3.

U2. Describe at least three ways of checking data quality.

1.

2.

3.

Dr. Akram, EDO Health, read a recent district report on data quality and felt very

disturbed by it.

“I need to take actions”, he said aloud. He paced back and forth thinking about his next steps to improve data quality. After some time, he calmed down and wrote his action plan. Please describe how Dr. Akram defined the problem and what major activities Dr. Akram must have included in his action plan for improving data quality…

PSa. Definition of the problem

PSb. Major activities

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

SELF-EFFICACY

This part of the questionnaire is about your perceived confidence in performing tasks related to health information systems. High Confidence indicates that person could perform the task, while low confidence means room for improvement or training. We are interested in knowing how confident you feel in performing HMIS-related tasks. Please be frank and rate your confidence honestly.

Please rate your confidence in percentages that you can accomplish the HMIS activities.

Rate your confidence for each situation with a percentage from the following scale 0 10 20 30 40 50 60 70 80 90 100

SE1. I can check data accuracy 0 10 20 30 40 50 60 70 80 90 100

SE2. I can calculate percentages/rates correctly 0 10 20 30 40 50 60 70 80 90 100

SE3. I can plot data by months or years 0 10 20 30 40 50 60 70 80 90 100

SE4. I can compute trend from bar charts 0 10 20 30 40 50 60 70 80 90 100

SE5. I can ex plain findings & their implications 0 10 20 30 40 50 60 70 80 90 100

SE6. I can use data for identifying gaps and setting targets 0 10 20 30 40 50 60 70 80 90 100

SE7. I can use data for making various types of decisions and providing feedback 0 10 20 30 40 50 60 70 80 90 100

We would like you to solve these problems about calculating percentages, rates and plotting and interpreting information.

C1. The estimated number of pregnant mothers is 340. Antenatal clinics have registered 170 pregnant mothers. Calculate the percentage of pregnant mothers in the district attending antenatal clinics.

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C2.The full immunization coverage for 12-23 month-old children were found 60%, 50%, 30%, 40%, 40% for years 1997, 1998, 1999, 2000 and 2001 respectively.

C2a. Develop a bar chart for coverage percentages by years

C2b. Explain the findings of bar chart

C2c. Did you find a trend in the data? If yes or no, explain reason for your answer

2d. Provide at least one use of above chart findings at:

UD1. Facility level

UD2. District level

UD3. Policy Level

UD4. Community level

UD5.Department/unit

C3. A survey in a district found 500 children under five years old that were malnourished. The total population of children less than five years old was 5000. What is the malnutrition rate?

C4. If the malnutrition rate in children less than 2 years old was 20% and the number

of total children less than 2 years old was 10,000, then calculate number of children who are malnourished.

N.B. **Facility refers to the hospital in general while department or unit refers to the different specialty health service provision sections which have adopted the new national HMIS.**

Annex-three-Information Sheet to get Permission for the Research

Introduction

This information sheet is prepared to explain the research project that you are asked to join by a group of research investigators. The main aim of this research project is to assess HMIS performance and associated factors using PRISM framework, Gondar university hospital, North West Ethiopia, 2012.The research team includes a final year MPH graduate student in health informatics and two senior advisors from University of Gondar, institute of Public health, college of medicine and health sciences in the university.

Name of Principal Investigator: KASSAHUN EMIRU

Name of Advisors: DESALEGN TIGABU (MD, MPH)

TESFAHUN MELESSE (Bsc, MPH)

Name of the Sponsor**: University of Gondar**

Name of Organization: **University of Gondar, College of Medicine and Health Sciences, Institute of Public Health:**

This information sheet is prepared by above mentioned researcher whose main aim is to assess HMIS performance and associated factors using PRISM framework, Gondar university hospital, northwest Ethiopia, 2012.The investigator is a final year MPH student with advisors from institute of public health, college of medicine and health sciences, university of Gondar.

Purpose:

The purpose of this research study is to assess HMIS performance and factors affecting it using PRISM framework, Gondar university hospital, North West Ethiopia, 2012. Results from this study will be used to assist in making recommendations for those who are responsible to improve HMIS performance for informed decision making and quality health care service delivery.

Procedure:

This study uses institutional based triangulated cross-sectional study design and multiple data sources will be used to increase validity of the findings. Ethical clearance will be found from university of Gondar. Letter of cooperation written from department of health informatics will be submitted to the university hospital and permission to conduct the study will be obtained from the hospital before the commencement of the study.

Risk and/or Discomfort:

There is no risk or discomfort that you will face by participating in this research except dedication of time for participating in the study. Any personal information registered will not be copied and transferred to other bodies. Every piece of information will be kept confidentially. There is no risk of participation in this research project.

Benefits:

This study will benefit both health care service providers and customers of the hospital through bringing quality of care, Patient satisfaction and data quality for informed decision making. The findings of the study will help the hospital in general and the hospital management in particular to improve the quality of service it is providing through informed decision making and improving areas where weaknesses are noticed. Bringing data quality and use of information in health management information system of tertiary health institutions has a paramount importance with regard to carrying out teaching and learning, research and health care delivery tasks with utmost quality.

Incentives/Payment for Participating:

There is no incentive or payment to be gained by taking part in this project.

Confidentiality:

All Personal identifiers & personal information will not be taken. The information Collected from this research project will be kept confidential. Information will be accessed by the researcher and research assistant only.

Persons to contact:

This research project will be reviewed and approved by the ethical committee of the University of Gondar. If you want to know more information you can contact the committee through the address below. If you have any question you may contact the following individuals

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Investigator: KASSAHUN EMIRU

Advisors: DESALEGN TIGABU (MD, MPH)

TESFAHUN MELESSE (BSC, MPH)

Annex four: Consent form

Dear health care workers /participants

The aim of this study is to assess performance of health management information system and associated factors at Gondar university hospital, North West Ethiopia, 2012. And you are chosen to participate in this study by chance.

The purpose of this study is to generate information about the performance of health management information system and associated factors in Gondar university hospital which may help responsible persons in the health institution, stakeholders and significant others to take actions based on the findings. The study will involve various interview and self administered questions. In order to effectively attain the objective of the research, we are kindly requesting your help. There are questions related to health information system performance and associated factors for you to respond and/or fill completely and there is no need to put your name or any other personal identifier on the questionnaire; no individual responses will be reported. Your responses will be completely confidential. It is your full right to refuse to respond to any of the questions partly or completely. However, your honest answers to these questions will help us for better understanding of performance of health management information system and associated factors in Gondar university hospital, so; we are requesting you to give your honest responses and to keep up participation.

Are you willing to participate in the study?

Yes ☐ No ☐

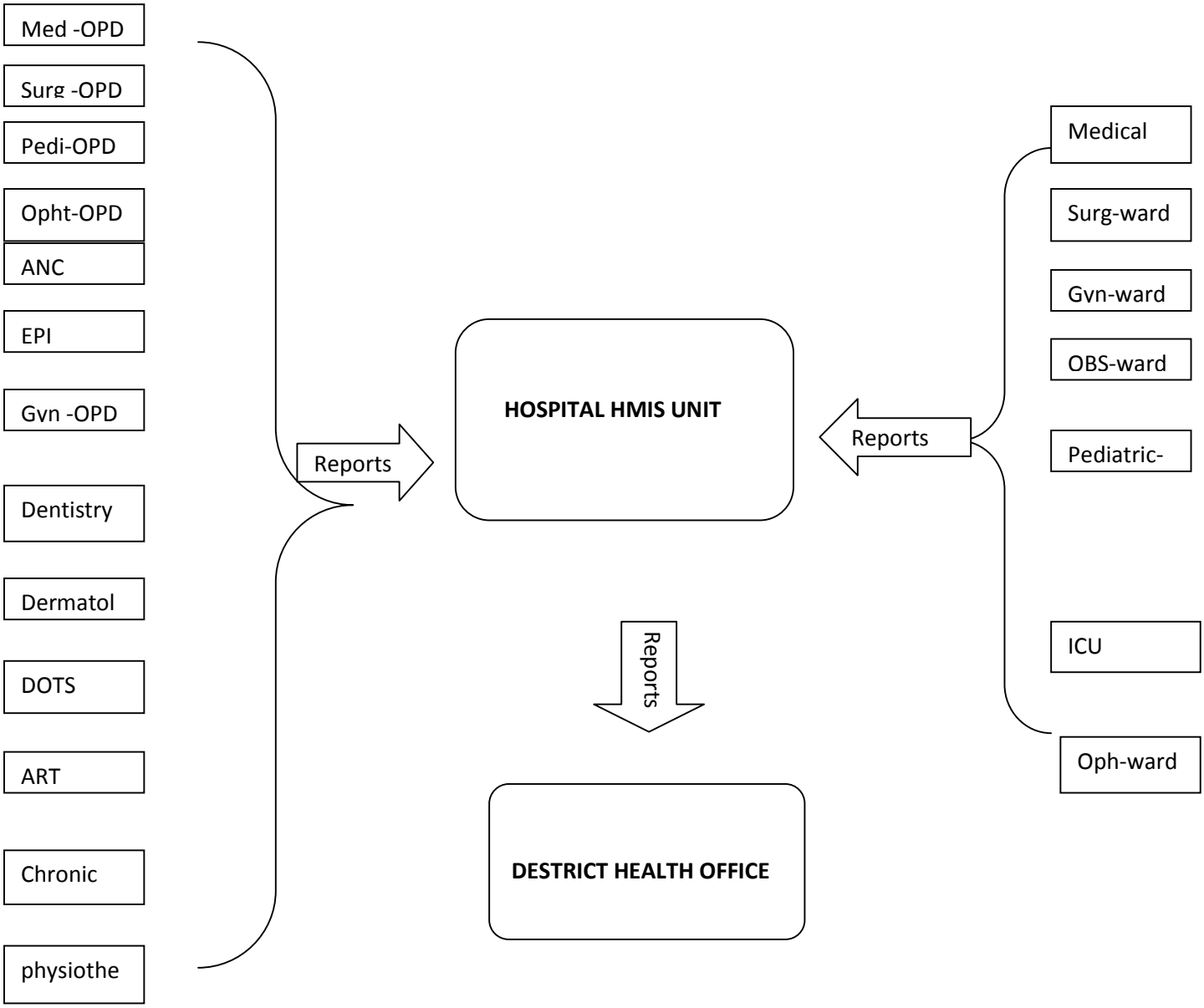
If you are willing to participate in this study please go to the next page.

For any further question, contact the investigator:

Name of investigator: Kassahun Emiru

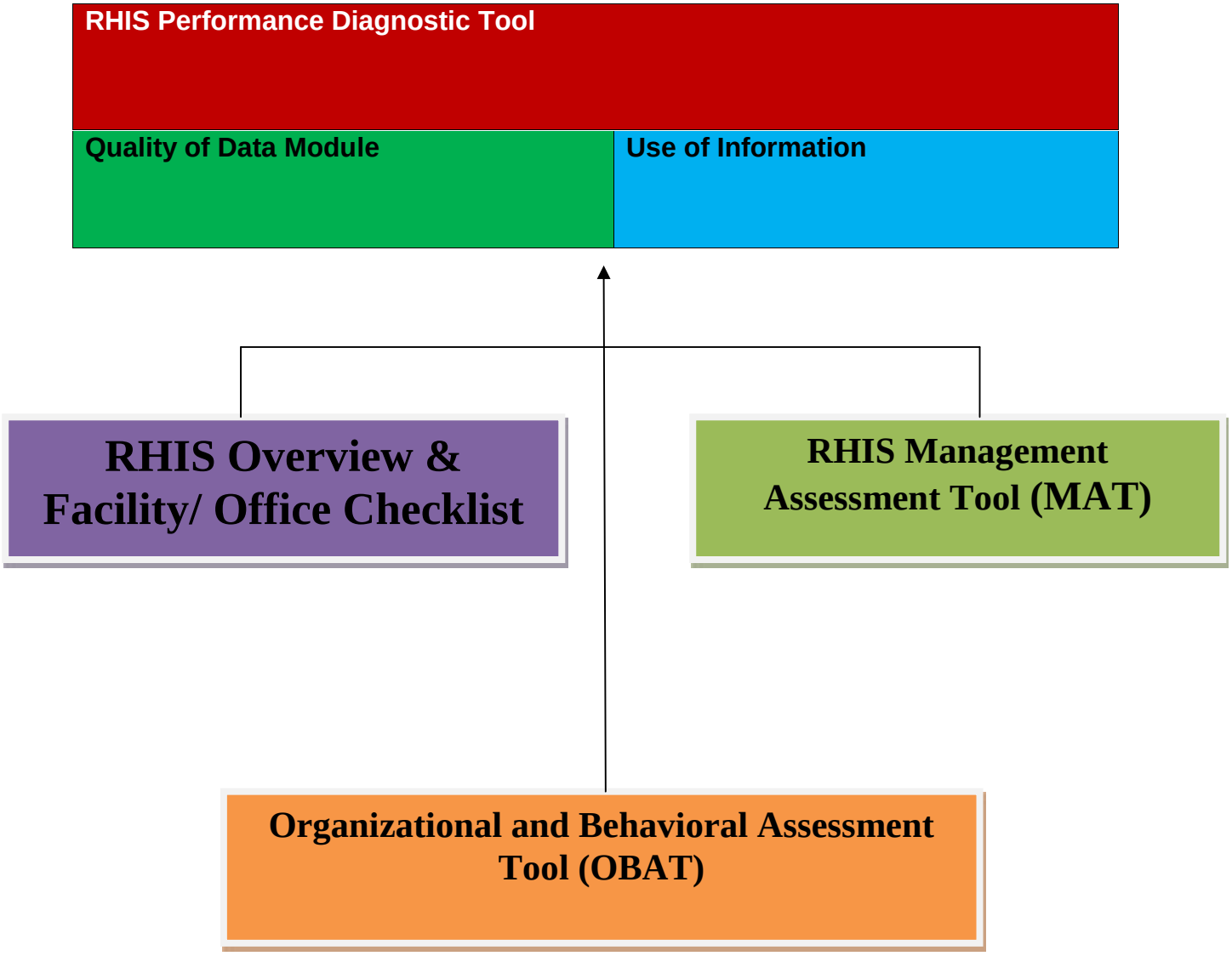
Telephone number: 0913349736

Annex five: HMIS information flow in Gondar university hospital.



Source: HMIS office, Gondar university hospital.

Annex six: PRISM tools.



Annex seven: PRISM conceptual frame work.

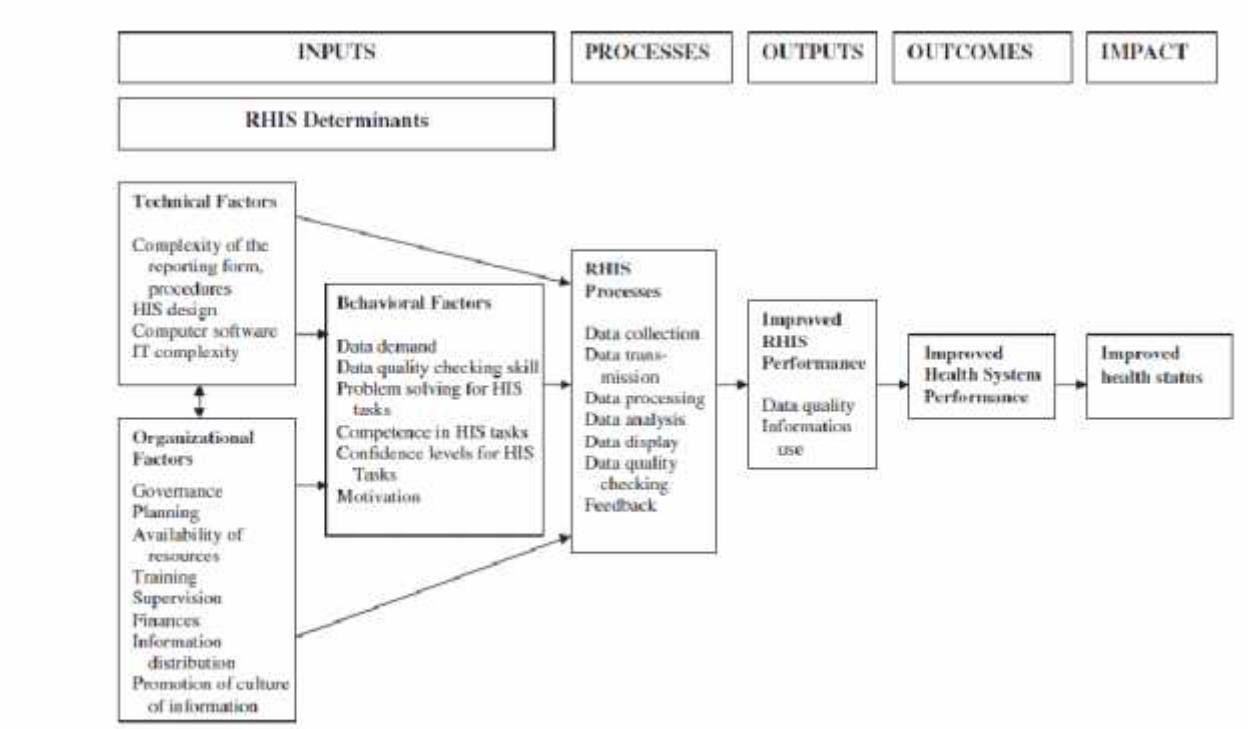
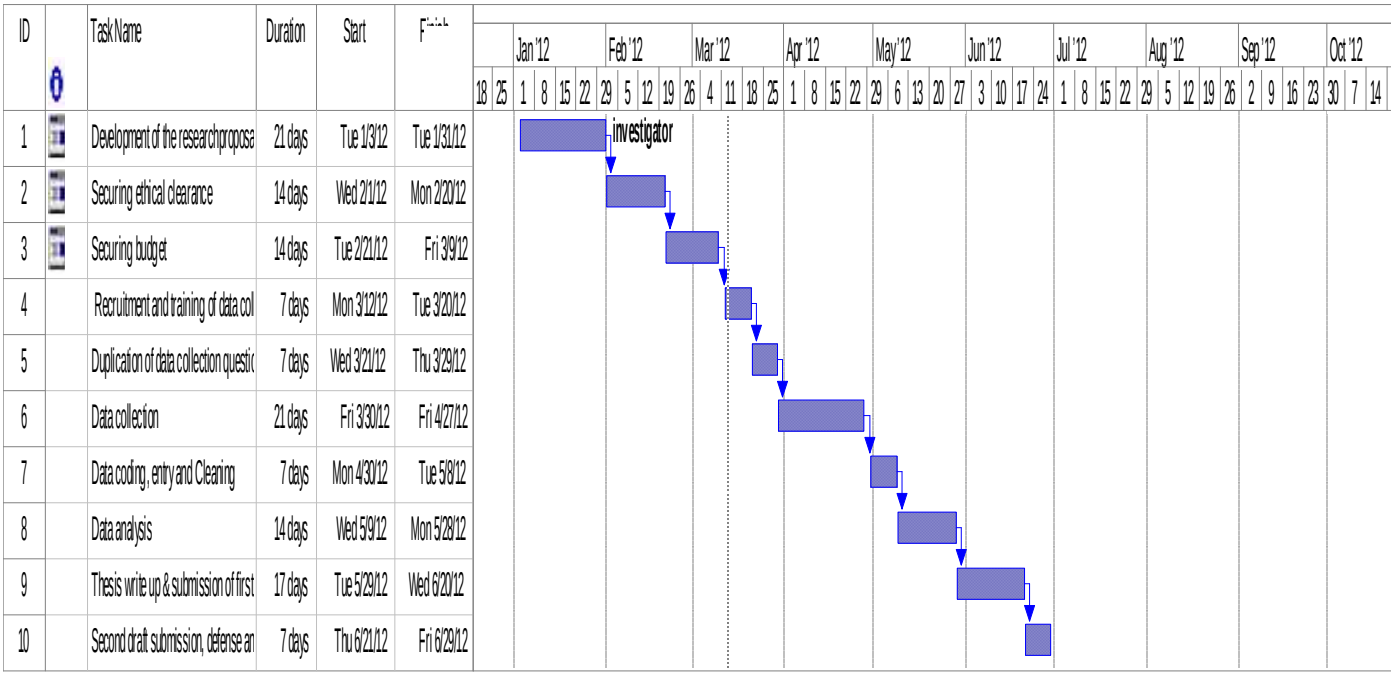


Figure 3 PRISM (Performance of Routine Information System Management) framework



Annex eight: Gantt chart

Annex-VIIII-Assurance of Investigator

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of required progress reports as preterm and conditions of the research and publications office of the University of Gondar.

Student's Name: Kassahun Emiru signature: _____Date_____

Approval of the advisors

Advisors' Name	Signature	Date
1. Desalegn Tegabu (MD, MPH)	_____	_____
2. Tesfahun Melese (Bsc, MPH)	_____	_____